

proceeds attracts oxygen and repels hydrogen; so that each of the elements of a particle of water, for instance, is subject to an attractive and a repulsive force, acting in contrary directions, the centres of action of which are reciprocally opposed. The action of each force in relation to a molecule of water situated in the course of the electric current is in the inverse ratio of the square of the distance at which it is exerted, thus giving (it is stated) for such a molecule a *constant force*? He explains the appearance of the elements at a distance from each other by referring to a succession of decompositions and recompositions occurring amongst the intervening particles,<sup>2</sup> and he thinks it probable that those which are about to separate at the poles unite to the two electricities there, and in consequence become gases.<sup>3</sup>

218. Sir Humphry Davy's celebrated Bakerian Lecture on some chemical agencies of electricity was read in November 1806, and is almost entirely occupied in the consideration of *electro-chemical decompositions*. The facts are of the utmost value, and, with the general points established, are universally known. The *mode of action* by which the effects take place is stated very generally, so generally, indeed, that probably a dozen precise schemes of electro-chemical action might be drawn up, differing essentially from each other, yet all agreeing with the statement there given.

219. When Sir Humphry Davy uses more particular expressions, he seems to refer the decomposing effects to the attractions of the poles. This is the case in the "general expression of facts" given at pp. 28 and 29 of the *Philosophical Transactions* for 1807, also at p. 30. Again at p. 160 of the *Elements of Chemical Philosophy* he speaks of the great attracting powers of the surfaces of the poles. He mentions the probability of a succession of decompositions and recompositions throughout the fluid,—agreeing in that respect with Grothuss; and supposes that the attractive and repellent agencies may be communicated from the metallic surfaces throughout the whole of the menstruum,<sup>5</sup> being communicated from *one particle to another particle of the same kind* and diminishing in strength

from the place of the poles to the middle point, which is necessarily neutral.<sup>7</sup> In reference to this diminution of power at

<sup>1</sup> *Annales de Chimie*, pp. 66, 67, also torn. Ixiii. p. 20.

<sup>2</sup> *Ibid.* torn Iviii. p. 68, torn. Ixiii. p. 20.

<sup>a</sup> *Ibid.* torn Ixiii. p. 34.

<sup>4</sup> *Philosophical Transactions*, 1807, pp. 29, 30.

<sup>5</sup> *Ibid.* p. 39. <sup>c</sup> *Ibid.* p. 29. <sup>d</sup> *Ibid.* p. 42.